

MISSION SERVICES PROGRAM OFFICE

**Demand Access System
Product Management Plan**

Original

31 May 2000



National Aeronautics and
Space Administration

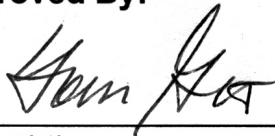
————— Goddard Space Flight Center —————
Greenbelt, Maryland

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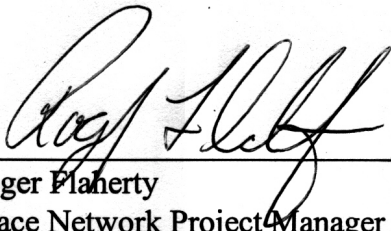
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Preface

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Section 1. Introduction

1.1 Purpose

The purpose of the Demand Access System (DAS) is to expand existing Tracking and Data Relay Satellite System (TDRSS) Multiple Access Return (MAR) capabilities at a relatively low cost. The DAS will build upon the Third Generation Beamformer System (TGBFS) by adding global system control and coordination functions, demodulation capabilities, and a data distribution network.

1.2 History

The existing Tracking and Data Relay Satellites (TDRSs) provide pre-scheduled communication service to customers by using ground-based electronics to process signals emanating from customers that are relayed by the TDRS on-board phased array antenna systems. The TGBFS expanded the capability of the TDRSs MAR system and will allow services to be provided on a demand basis rather than on a pre-scheduled basis.

1.3 Goals

The goals of the DAS are to provide:

- a. Immediate access to services by the customer.
- b. Extended duration services.
- c. Simplified resource allocation and operation.
- d. Reduction of service cost.
- e. New capabilities such as:
 - 1) Immediate science alerts
 - 2) Polling of spacecraft
 - 3) Autonomous requests for MA service

1.4 Overall Approach

The approach of the DAS product development and deployment is to establish a basic operational infrastructure, which can be added to at later dates as needs expand. The basic infrastructure will consist of control and monitoring functions for beamforming, demodulating, and data archiving and distribution. A single fully populated Commercial-off-the-shelf (COTS) beamformer will be procured as a part of this project and the existing fully populated pre-production Independent Beamformer Unit Group (IBUG) will be incorporated into the DAS. Demodulator equipment will be developed and procured as part of the DAS effort. One group of beamforming/demodulating equipment will be installed at the White Sands Ground Terminal/Second TDRSS Ground Terminal (WSGT/STGT) in New Mexico and one at the Guam Remote Ground Terminal (GRGT). At the conclusion of the DAS Product development, the demodulating equipment is expected to be available as COTS items. The beamforming equipment is already a COTS item.

1.5 Timeframe

The DAS Product development and deployment is projected to commence in the first quarter of CY00 and complete in the first quarter of CY02.

Section 2. Objectives

2.1 Objectives

The objectives of the new services enabled by DAS are:

- a. Provide a capability for continuous, conflict-free, DAS MA return link services 24 hours per day, 7 days per week upon demand from customers.
- b. Provide an automated capability to transition DAS customer services between TDRSs/SGLTs.
- c. Provide a capability to support multiple, independent MA return links per TDRS/SGLT/Ground Station.
- d. Meet or exceed current communications performance and capabilities of the existing MA return link with the exceptions of the functions not possible due to the lack of tie-ins with the MA forward link
- e. Provide demodulation and data distribution capabilities for each DAS data service.
- f. Automate the operation of all DAS return link services.
- g. Provide COTS data and control interfaces for DAS customers with the flexibility of accommodating non-standard/customer-unique telemetry interfaces (e.g. use of dedicated T1s and/or fiber).
- h. Provide simple, low cost, modular expansion capabilities to facilitate the addition of DAS return link channels as needs change.

Section 3. Customer Definition and Advocacy

3.1 Expected/Projected Customer Base

The DAS will provide services to emerging classes of customers, which cannot practically be supported by the existing Space Network (SN). These are customers requiring continuous support to meet mission requirements and customers that require instant service upon demand.

3.2 Low Cost

Customers will be provided several options to reduce cost as compared to circa 1998 MA return service rates. It is expected that DAS services will be offered on a subscription basis rather than a per-minute basis.

DAS will allow costs to be reduced by allowing the possibility for:

- a. Procuring beamforming and demodulating equipment for the customer's exclusive use.
- b. Using shared beamforming and demodulating equipment supplied by NASA.

Section 4. Product Authority

4.1 Project Commitment Document

Product authority is derived from the Goddard Space Flight Center (GSFC) Project Commitment Document (PCD) titled Demand Access System (DAS) Development and Deployment.

Section 5. Management

5.1 General

To achieve the DAS development and deployment objectives a management approach is being adopted that capitalizes on experience gained from the White Sands Complex (WSC) Upgrade, the Guam Remote Ground Terminal Implementation, and the TGBFS Product Development. This approach will employ an existing management structure with the authority and responsibility residing with the DAS Product Manager. Other resources shall be utilized when appropriate.

5.2 NASA Responsibilities

5.2.1 SN Organization

The SN (GSFC Code 451) organization and responsibilities are described in the SN Project Plan (451-PG-7120.2.1A). DAS Product organizational relationships, matrixed personnel, and support and implementation contractors are shown in Figure 5-1. The functional responsibilities of key personnel for the DAS are shown in Table 5-1.

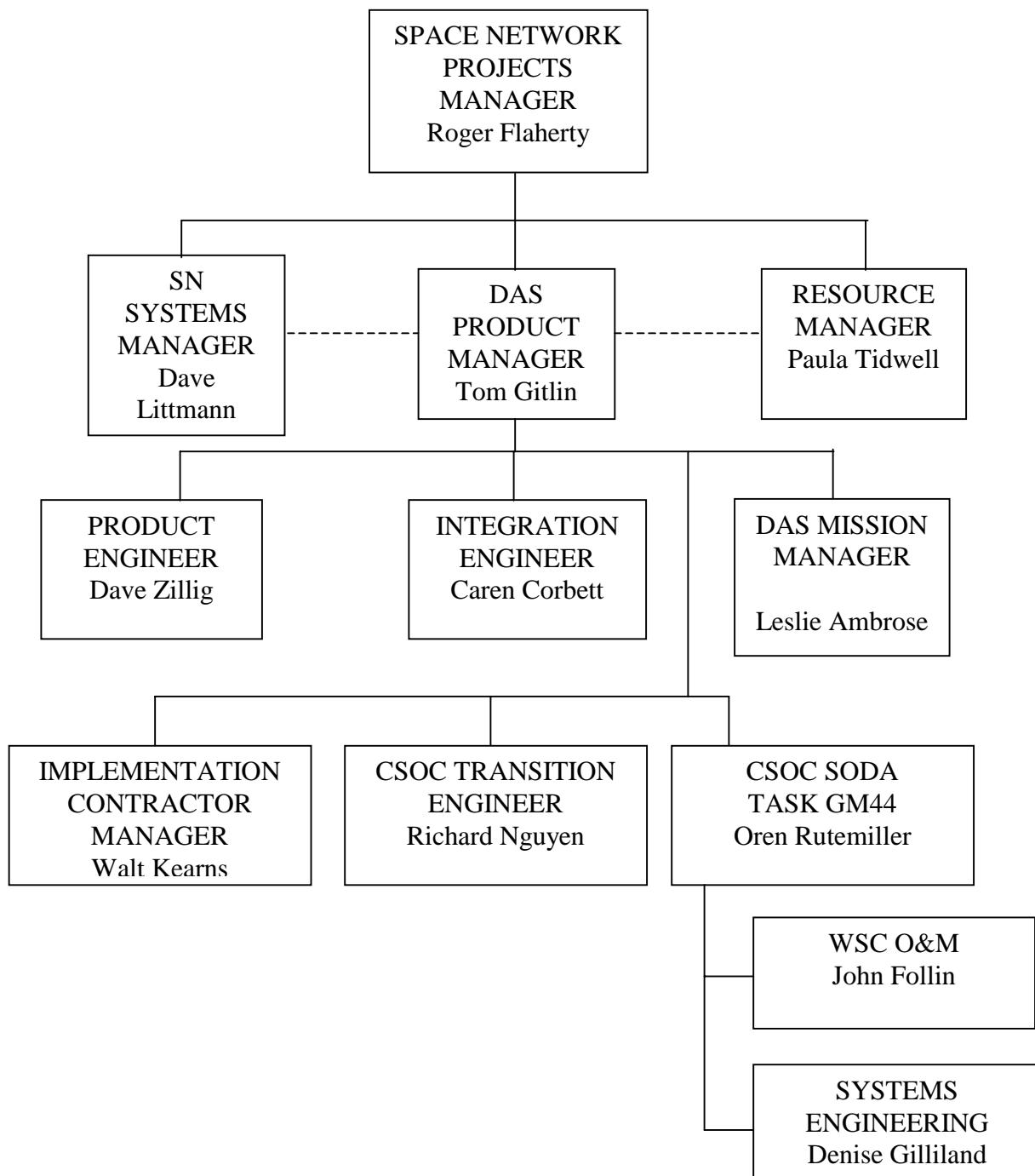


Figure 5-1. DAS Organization

Table 5-1. Responsibility Matrix

	PRODUCT MANAGER	SN SYSTEMS MANAGER	RESOURCE MANAGER	PRODUCT ENGINEER	INTEGRATION ENGINEER	DAS MISSION MANAGER	IMPLEMENTATION	SODA TASK GM 44	WSC O&M	SODA SYSTEMS ENGINEER	CSOC TRANSITION
Product Management	√						√	A			
Interface to Systems Engineering Team		√									A
SODA Task Management								√			
Reporting Management (120.1) (830.1)	√		√				√	A			
Product Assurance (120.2)	√				√		√		√		
Configuration Management (120.3)	√				A	A	√	A	A	A	
Contract Management (120.4)	√		√				√				
Risk Management (120.5)	√						√	A		A	
Cost/Schedule Control (120.6)	√		√				√				
Trade Studies (220.2)	√	√				√	√	A		A	
Requirements, Specifications and ICDs (300)	√	√		√			√		A	A	
Design (350)				√			√				
Verification Planning (820)	√				√	√	√	A	A	A	
Security	√	√				√	√				
Safety	√	√	√	√	√	√	√		√	√	
Development (420) (430)				√			√		A		
Integration and Test (240)				A	√	√	√			A	
Shipping							√		√		
Installation (710)							A		√		
Installation Test (240)					√		√		A		
Acceptance Tests (240)	√				√	√	√		A	A	
Training (740)							√		√		
ILS Plan (730)							√		A		
Operations and Maintenance (730) (750)		√					√		A	A	
Transition to Operations (750)		√			√	√	A		√	√	√
A = Assist Numbers in Parentheses are derived from Code 450 Work Breakdown Structure (WBS)											

5.2.2 Definitions

Product Management - Ensure the performance of all management functions necessary for delivery of the DAS product. Direct and control system definition, design development, and validation of the system. Develop and implement the product plan to define the schedule and to identify, justify, allocate, obligate, account, and manage fiscal and human resources (civil service and contractor) necessary to deliver the DAS product. Liaison with other NASA products and offices is performed under this responsibility.

Interface to Systems Engineering Team - Advise the Product Manager of TDRS system requirements that could affect the implementation of the DAS. Monitor the DAS implementation to ensure compatibility with as-built and/or future installations.

SODA Task Management - Management of the support provided to the DAS Product Manager via the Consolidated Space Operations Contract (CSOC) Space Operations Directive Agreement (SODA) Task GM 44, SN Systems Engineering. Support includes but is not limited to development of the Product Management Plan, the Top Level Schedule, the Concept of Operations, the Top Level Requirements Data Item Descriptions, and the Top Level Performance Verification Matrix.

Reporting Management - Establish and maintain a monthly reporting system to provide management with selected information required to ensure accountability for product status, indicate trends, establish control of schedule actions and changes and illustrate funding requirements. The implementation contractor will submit written Monthly Progress Reports reviewing the technical status and indicating progress in achieving scheduled product milestones. Records of the evaluation process will be maintained throughout the duration of the product in accordance with GPG 1710.1A (Corrective and Preventive Action). These records will be utilized to develop a database of lessons learned that will be compiled and published at the conclusion of the product.

Product Assurance - Control all phases of DAS product development to ensure that DAS systems meet the standards and tolerances as required by NHB 5300.4 (1B), 450-PG 8730.3.1.

Configuration Management - Maintain system requirements and documentation baselines in a disciplined and traceable manner to support the development and delivery of the product. Procedures and guidelines are described in the MSP Configuration Management Plan (450-PG-8700.2.1)

Contract Management - Ensuring that a complete and precise description of the requirements are developed, reviewed and approved. Coordination of contract modifications with the contracting officer. Establishment of procedures for disseminating information regarding contract modifications to the concerned product functions. Facilitating the recording, documentation, retention, and maintenance of contract performance data during contract execution and contract completion. Ensuring compliance with GPG 5100.1, GPG 1440.7, and GPG 5100.2.

Risk Management - Assessment of risk areas (technical, cost and schedule). Risks will be assessed and mitigation plans addressed on a monthly basis. Newly identified risks will be reported when they occur.

Cost/Schedule Control - Establish and support a formal performance measurement system that will realistically monitor the actual work completed versus the budget and schedule agreements. Prepare all financial and schedule performance and status reports to permit upper levels of management to exercise necessary cost/schedule control over the DAS product.

Trade Studies - Exploration of the full range of options, including concepts, technology availability, and technology needs.

Requirements, Specifications and ICDs - Establish and maintain all system requirements and system interface control documents for the product. Allocate system functional and performance requirements and specifications to traceable hardware and software functions; generate software requirements specifications and software interface requirements specifications. Approve all hardware and software design specifications.

Design - Perform and maintain the system design necessary to meet the overall DAS specifications. Conduct and plan formal documented reviews of the design results.

Verification Planning - Generate all system level test plans and supporting documentation outlining the methodology for verification of the requirements. Conduct system level performance analyses to ensure that DAS requirements have been verified. Approve system level test procedures. Approve all hardware and software configuration item test plans and procedures.

Security – Ensure equipment, material, and procedures are present which provide personnel, physical, communications, computer and information security in established in the (TBD) Perform a security assessment at the appropriate point.

Safety – Ensure compliance with the safety policies and procedures established in the NASA Safety Policy and Requirements document, NHB 1700.1.

Development – Develop and build hardware, software and firmware systems to meet requirements. Perform appropriate subunit tests. Maintain development documentation for all new development items. Prepare appropriate engineering changes. All documents produced will be created and maintained in accordance with the MSP Configuration Management Process (450-PG-8700.2.1A)

Integration and Test - Integrate and Test each deliverable system. Develop Test Plans. Develop test procedures enumerating step-by step items that must be done to carry out a test plan. Formally document all tests in test reports in accordance with 450-PG-8700.1.1. Maintain test reports as a quality record.

Shipping- Disassemble the deliverable systems, package, and ship the DAS equipment to the appropriate sites.

Installation – Perform the installation of the deliverable systems at the appropriate sites.

Installation Test - Conduct tests on the DAS systems and components to identify any damage due to shipping, and to verify that assembly, and integration procedures have been correctly performed.

Acceptance Tests – Conduct system and subsystem tests to verify and validate adherence to requirements.

Training – Develop plans and procedures to ensure all maintenance and operations of the DAS are performed in a safe and satisfactory manner. Classroom training and training on actual equipment are included in this responsibility.

Integrated Logistics Support Plan (ILSP) – Provide logistics support to the DAS product effort including provision of spare mechanical and electronic parts and the procurement of equipment and materials necessary to support operation and maintenance functions. Any statistical techniques used in maintenance support will be documented in the ILSP and will be in accordance with Identification and Application of Statistical Techniques, GPG 8070.2.

Operations and Maintenance – Develop plans and concepts to operate and maintain the DAS within the SN. The overall operations concept is to provide continuous, undisturbed, and reliable operations to all DAS users. Develop plans and procedures to conduct corrective and preventive maintenance on all DAS systems and subsystems.

Transition to Operations – Perform activities that are necessary to integrate the DAS into the operational Space Network. After successful handover of the DAS capability from the Product Team to the CSOC contractor, the Systems Engineering Process for the DAS product is concluded.

5.3 Contractor Responsibilities

DAS development, hardware procurement, installation and test shall be implemented through a contract with the implementor. Other activities shall be implemented through a Consolidated Space Operations Contract (CSOC) Space Operations Directive Agreement (SODA), GM 44, SN Systems Engineering.

Section 6. Technical Summary

6.1 Product Requirements

DAS shall provide the following:

- a. MA return service capabilities
- b. A customer interface capability.
- c. A service management capability.

6.2 Functions

Figure 6-1 depicts the high level DAS functional architecture. Primary functions include:

- a. A customer planning function that enables customers to request services.
- b. A control function that processes requests and allocates the DAS resources necessary to provide services.
- c. Switching functions
- d. Beamforming functions.
- e. Demodulating functions.
- f. A customer data routing and archiving function.

6.3 Operations Concept

The DAS Operations Concept is defined in a separate document.

6.4 System Constraints

6.4.1 EMC/Beamforming Connectivity

The DAS only provides return link services, not forward services. Customers requiring the use of a forward link may schedule services via other systems (i.e. NCC / SN Web Services Interface [SWSI])

The DAS is compatible with customers that adhere to SN MA return signal parameters.

6.5 Ground Systems and Support

DAS equipment will be collocated with TDRSS equipment at WSGT/STGT and GRGT. O&M support will be provided under the current CSOC contract.

6.6 Facilities

The DAS will be installed in the WSGT/STGT and in the GRGT. No significant facility modifications are required for these installations. Power will be drawn from existing Technical Power panels and power and power cables will be routed primarily in existing cableways. Where necessary, the DAS may require new power outlet boxes and cable hangers within the existing underfloor infrastructure.

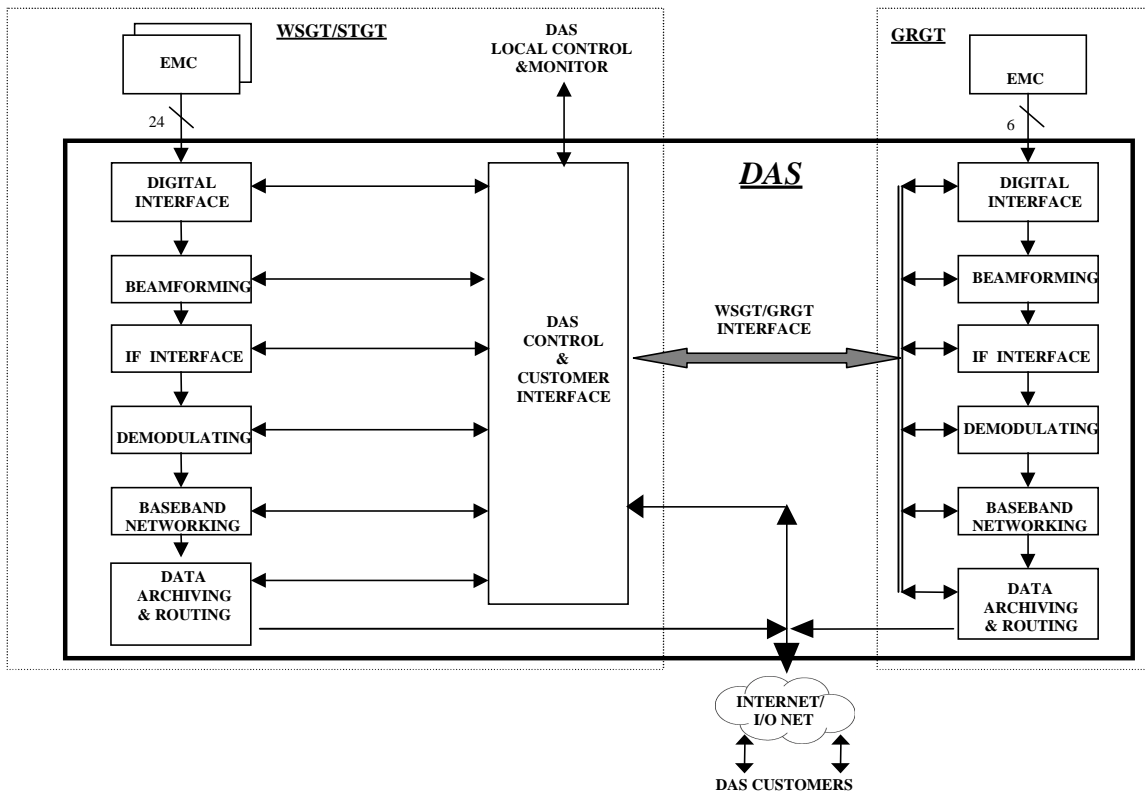


Figure 6-1. DAS Reference Architecture

6.7 Logistics

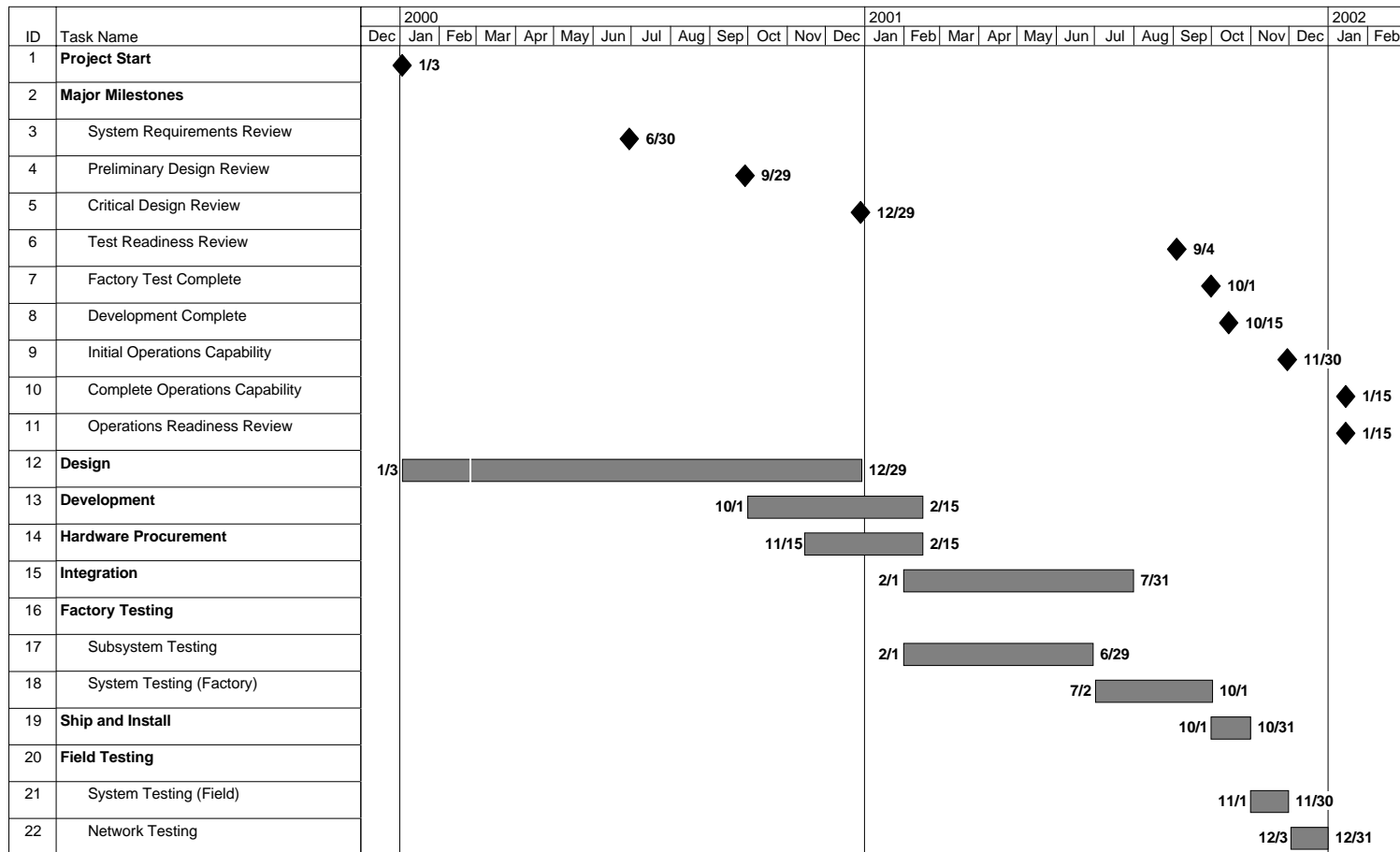
The implementation contractor will be required to prepare an Integrated Logistic Support Plan that will define the logistic requirements of the DAS. The following elements will be assessed in developing this plan:

- Maintenance planning.
- Sparing Plan.
- Supply, product, and sales support.
- Support and test equipment.
- Packaging, handling, storage, and transportation.
- Training and logistic support personnel.
- Government furnished and contractor furnished equipment.
- Technical data and documentation.

6.8 Mission Results Analysis and Reporting

DAS will be integrated into the CSOC catalog of services. DAS performance analysis will be included as an element of routine reports provided for Space Network proficiency.

Section 7. Schedule



Section 8. Resources

8.1 Product Budget

DAS funding requirements are based on the POP 00-1 budget exercise. Funding will be provided under UPN 218-10.

8.2 Labor Requirements

Estimates of Civil Service requirements are provided in Table 8-1. The bases of these estimates are derived from previous product development experience. The estimates do not include system implementation contractor labor requirements. CSOC recurring labor is contained in the DAS PCD. CSOC implementation labor is contained in SODA task GM44.

Table 8-1. DAS Detailed Labor Requirements – Civil Service

POSITION	FY00	FY01	FY02	TOTAL
DAS PRODUCT MANAGER	0.5	1	0.5	2
RESOURCE MANAGER	0.1	0.1	0.1	0.3
PRODUCT ENGINEER	0.1	0.2	0.1	0.4
INTEGRATION ENGINEER	0.2	0.4	0.2	0.8
DAS MISSION MANAGER	0.1	0.2	0.1	0.4
QUALITY ASSURANCE MANAGER	0.1	0.1	0.1	0.3

8.3 Cost Estimates

The cost estimates for the DAS Product are available from the DAS Product Manager.

Section 9. Controls

9.1 Parameters requiring approval by the Space Operations Management Office (SOMO)

Changes to parameters detailed in the DAS PCD regarding performance, cost, or schedule requirements will be submitted to SOMO.

9.2 Product Manager Controls

The DAS Product Manager will exercise control of the implementation budget, schedules, procurements, risk management planning, requirements performance and baseline documents. This control will be maintained through the configuration management process defined in the 450/Mission Service Program (MSP) Configuration Management Plan (450-PG-8700.2.1A), the Performance Verification Plan, regular status meetings, monthly technical and financial reviews, and an action item reporting system.

Section 10. Implementation Approach

10.1 Implementation Approach

The DAS will be developed and installed via a contract with the implementor and through tasking to CSOC via a SODA task. DAS requirements will be defined, documented, and reviewed. A System Requirements Review, Preliminary Design Review, and Critical Design Review will be conducted. Pre and post test reviews will be conducted for system and subsystem tests, acceptance tests, and networks integration tests.

10.2 Product Summary Work Breakdown Structure

Figure 5-1 contains the Summary WBS for the DAS product relative to the GSFC Code 450 WBS.

Section 11. Acquisition Summary

Appropriate tasking via a contractual vehicle will serve to define the agreement between the implementation contractor and the Government. CSOC SODA tasking will be used to have work performed during all phases of the DAS effort.

Section 12. Program/Project Dependencies

12.1 TGBFS Successful Deployment

Successful deployment of the TGBFS equipment is required since the EMCs and pre-production beamformer group are needed for DAS. The TGBFS completed on schedule . TGBFS completion is expected in June 2000, well in advance of an expected need date for the equipment for DAS in early CY01.

12.2 Availability of COTS Beamformer Groups

Beamformer groups are being advertised as commercially available items (COTS). It is expected that Beamformer groups will be procured as part of the DAS effort.

12.3 DAS Receiver Development

Successful acquisition of compatible DAS receivers is required. Industry surveys will be used to identify appropriate vendors. Moderate risk exists in this area.

Section 13. Agreements

There are no external or internal agreements concerning DAS with other Government Agencies or commercial enterprises.

Section 14. Performance Assurance

14.1 Performance Assurance Plan

14.1.1 Performance Assurance Goals

The DAS Performance Assurance goals are:

- a. Demonstrate that the DAS system is fully operational in accordance with the requirements established.
- b. Demonstrate that the product goals for system quality, reliability, operability, maintainability, availability, capacity and life cycle cost have been attained.
- c. Conduct all testing in such a manner that is transparent to all Space Network customers to the maximum extent possible.

14.1.2 Performance Assurance Strategy

The DAS Performance Assurance strategy is intended to minimize the risk that a product requirement has not been met while maximizing the usefulness of the data obtained from each step of the test process. The elements of this strategy are:

- a. Ensure the traceability of every requirement from conception to system acceptance.
- b. Structure the performance verification process such that the chance of exposing previously undetected error is maximized while the overall cost of testing is minimized.
- c. Demonstrate the viability of high-risk components or designs early in the implementation phase.
- d. Maximize in-plant demonstrations to show that design concepts and requirements as well as maintainability requirements have been met.

14.2 Guidelines

The GSFC Office of Systems Safety and Mission Assurance procedures and guidelines, 300-PG-7120.2.2 (Mission Assurance Guidelines [MAG] for tailoring to the needs of GSFC Projects) defines the processes for assuring Ground Data Systems. The implementation contractor will be required to provide an assurance plan that conforms to these guidelines. Included in the plan will be processes for assuring reliability, maintainability, availability, hardware quality, parts analysis, material control, process control, contamination control, and software assurance.

14.3 Performance Verification Plan

The DAS Systems Engineering Support contractor will prepare and deliver a top level Performance Verification Matrix that will be a primary tool used in conducting the Performance Verification Program. The matrix will relate the DAS Requirements Specification to the verification methods required to verify that all requirements have been met. The DAS implementation contractor will use this matrix to relate the system

architecture and design to the requirements specification and to the tests/demonstrations/inspections/analyses required to verify that all requirements at each level have been met. All requirements will be mapped into the matrix by paragraph reference to specific test procedures which verify the requirement at the applicable system, subsystem, hardware, software or other levels. This matrix will be maintained throughout the project duration and will serve as a quality record to be used during internal audits.

14.4 Testing

The implementation contractor will develop a Test Plan that includes acceptance tests, system/subsystem tests, unit test, and software tests. Test procedures will be defined that enumerate step-by-step items that must be accomplished to carry out the plan. All tests shall be formally documented in reports and retained.

14.5 Document Review

All product documents will be submitted for review by the DAS Product Manager. The implementation contractor will submit a table defining the documents to be prepared for this product. The table will list the document name, the format, the current status, the date drafts were delivered for approval, and the approval date. This table will be included in the slides presented at the Monthly Status Review.

14.6 Lessons Learned

Records of the assurance process, including actions taken to correct nonconformance, will be maintained throughout the project. These records will be used to develop a database of lessons learned, which will be compiled and published at the conclusion of the project.

Section 15. Risk Management

15.1 Overall Risk Assessment

The technical risk associated with the DAS development is moderately low since established technology has been applied from the outset.

The schedule is ambitious. If a modest schedule slip occurs in the completion of the DAS there is a modest amount of slack that can be absorbed.

Establishing suitable incentives with the implementation contractor and/or reducing the scope of the contract can mitigate cost growth.

Items that are deemed necessary for closely monitoring are described in Table 15-1. Items resulting from reviews and weekly status meetings that merit attention will be added or deleted from this list as required.

15.2 Risk Management Matrix

Table 15-1. Risk Management Matrix

RISK	MITIGATION
Unsuccessful deployment of TGBFS	TGBFS completed on schedule June of 2000. This is well in advance of the expected need date for DAS.
Long Lead-Time for IBUGs	Specific long-lead components appear to pose a risk. An IBUG will be ordered early in the product development cycle.
Receiver Procurement and Integration Schedule	Industry surveys being performed. Integration into the DAS system will require and ICD to be developed if a third-party provider is selected. Incentives may need to be applied.
Lack of availability of CSOC support	Additional funding for alternate contractor to provide support and/or services
Delayed Implementation Schedule	Additional funds, takeouts, reschedule

Section 16. Environmental Impact

The DAS will be installed in existing Space Network facilities. The type of equipment to be installed is entirely consistent with equipment already installed in the facilities.

Section 17. Safety

The NASA Office of the Chief Engineer Procedures and Guidelines NPG 7120.5A (NASA Program and Project Management Processes and Requirements) define the requirement to establish a safety activity as a part of the risk management process. The DAS Product Manager will include safety as an agenda item in the Monthly Status Review process.

Section 18. Technology Assessment

DAS will utilize new technology related to miniaturization, advanced beamforming functions, and data processing and distribution functions.

Section 19. Commercialization

The beamforming equipment is currently a COTS item. The services by DAS will be included in the SOMO services catalog and could be sold to commercial entities.

Section 20. Reviews

20.1 General

Milestone and periodic reviews will be conducted to measure the product performance and compare that performance with the product plan. Reviews will address as a minimum, technical achievements, adherence to schedules, projected costs, issues concerns, plans for addressing previously unanticipated occurrences, and other project metrics.

20.2 Document Review/Approval

The Product Management Plan, the System Requirements Document and External ICDs configuration controlled by MSP processes. All other documentation will be configuration managed as directed by the DAS Product Manager

20.3 Milestone Reviews

A series of comprehensive system level reviews will be conducted with support from the MSP Office System Engineering Team (SET). The primary objective of these reviews is to enhance the probability of success of the DAS development.

20.3.1 System Requirements Review (SRR)

The SRR will present the functional requirements and specifications for the DAS to ensure that the product is proceeding toward the objectives in a logical manner and that adequate consideration has been given to all facets of the DAS.

Drafts of the following documents will be available for review at the SRR:

- a. Contractor Product Management Plan
- b. Concept of Operations
- c. System Requirements Specification
- d. CM Plan
- e. QA Plan
- f. Government Performance Verification Matrix
- g. External ICDs
- h. Hardware/Software System Architecture(s)

20.3.2 Preliminary Design Review (PDR)

The PDR will be conducted to ensure that all requirements have been allocated to system, subsystem and component levels. Functions performed by each system element are documented; and ICDs document the format and content of system element's inputs and outputs.

Drafts of the following documents will be available for review at the PDR:

- a. System/Subsystem Specification
- b. Hardware/Software Configuration Item Specifications Hardware/Software System Architectures
- c. Internal ICDs
- d. Contractor PVM
- e. ILSP
- f. Training Plan
- g. Acceptance Test Plan
- h. System Design
- i. Rack and Chassis Designs
- j. Preliminary Software Design

20.3.3 Critical Design Review (CDR)

The CDR will be conducted to ensure that the design of each element of the system is expected to meet the functional, performance and interface requirements. Risk areas will be assessed on a technical, cost, and schedule basis.

Drafts of the following documents will be available for review at the CDR:

- a. Detailed Hardware Designs
- b. Detailed Software Design Documentation
- c. Updated Acceptance Test Plan to include the System/Sub-system Test Plan and the Acceptance Test Procedures
- d. Software Test Plan and Procedures
- e. RMA Analysis to include FEMA Analysis
- f. Updated ILSP to include Sparing Plan
- g. Risk Analysis
- h. Approved Deviation Requests

20.3.4 Test Readiness Review (TRR)

The objective of the TRR is to ensure that test procedures are complete and to ensure that the product is prepared for testing. Test plans will be evaluated for compliance with the PVM. Test procedures will be evaluated for compliance with the Test Plan.

Drafts of the following documents will be available for review at the TRR:

- a. Updated Acceptance Test plan to include the System/Sub-system Test Procedures
- b. Installation Plan
- c. O&M Manual

- d. Training Materials
- e. Status of Discrepancy Reports

20.3.5 Operational Readiness Review (ORR)/Transition Readiness Review (TNRR)

The objective of the ORR/TNRR is to determine the readiness of the DAS to provide services to customers and to transfer responsibility for DAS to the CSOC contractor. This review will be conducted after integration of the DAS into the Space Network and will present the integration and test results. The ORR/TNRR will baseline the capabilities, performance and operational characteristics of the DAS services provided to customers through the SN.

The following documents will be available for review at the ORR:

- a. PVM
- b. Approved Waivers
- c. Acceptance Test Report including Test and Demonstration Results, Analysis results, and Inspection Results.
- d. As built hardware and software documentation
- e. Configuration audit
- f. System Discrepancy Reports
- g. Product History

20.4 Periodic Reports

20.4.1 Monthly Status Reviews (MSR)

The implementation contractor will present a monthly oral review to the DAS Product Manager reviewing the technical status and indication progress in achieving scheduled project milestones. A separate financial report shall be presented monthly. The MSR package will suffice as a Monthly Progress Report.

20.4.2 Action Item Report

The systems engineering support contractor will submit a weekly report of action items that ensures the actions to be taken are clearly defined and responsibility is assigned. The report will indicate which items are closed and the rationale for closure, which items are open, and the scheduled closure date. This report will note if any changes in the progress/status of action items have changed since the last report.

20.4.3 Top Problems/Issues Report

The systems engineering support contractor will submit monthly a report of the top problems/issues that have been identified by the Product Manager. This report will be reviewed at the Monthly Status Review and updated as necessary to reflect the status of their resolution.

20.4.4 Monthly Status Reports

Technical performance, cost, and schedule parameters described in the DAS PCD have been approved by SOMO. The DAS Product Manager will provide status reports on a monthly basis. These Monthly Status Reports (MSR) will include the following:

- A “fever chart” indicating high level status of key areas including schedule, cost, and technical quality.
- A list of project highlights and issues, including descriptive statements, probable programmatic impacts, major actions and status updates of significant open problems and issues.
- A Gantt-style schedule chart

The DAS Product Manager will supply these reports to the Data Services Upgrades Manager

Section 21. Tailoring

Product management, responsibilities, controls, implementation approach, performance, risk management, and reviews have been tailored to the size and scope of the DAS Product.

Section 22. Change Log

Page	Section	Description of Changes
Cover Page		Change MO&DSD to N&MSP
Cover Page		Change Project to Product in document title
Signature Page		Change Project to Product in document title
		Change Project to Product in T. Gitlins title
		Add SN Project Managers signature line
i	Preface	Change Project to Product
i	Preface	Add “Code 451” and zip to address
3-1	3.1	delete part of last line after 2 nd comma and replace 1 st comma with the word “and”
3-1	3-2	First line: add additional text
5-2	Figure 5-1	Expand box to show Dave Littmanns last name
5-4	5.2.2	Product Assurance – deleted “TBD”
5-6	5.3	Capitalized “S” in systems engineering on last line of page
6-1	6.1a	Delete “An”. Change “capability” to “capabilities”
6-1	6.4.1	last line – delete “only”
9-1		Renumbered sections
9-1	9.1	Moved text to new section 20.4.4
12-1	12.1	2 nd Sentence-Changed to indicated TGBFS completion
12-1	12.2	corrected typo – add b to availability
15-1	Table 15-1	1 st row-changed to indicate TGBFS completion
20-1	20.3	1 st sentence-changed “by” to “with support from”
20-1	20.3	Deleted last sentence
20-1	20.3.1.a	Added the word “Contractor
20-3	20.3.5	end of 1 st sentence-added text
20-4	20.4.4	Added new section with text from section 9.1
AB-1		Acronym List filled in

Abbreviations and Acronyms

CDR	Critical Design Review
CM	Configuration Management
COTS	Commercial-off-the- shelf
CSOC	Consolidated Space Operations Contract
DAS	Demand Access System
FEMA	Failure Mode and Effects Analysis
GRGT	Guam Remote Ground Terminal
IBUG	Independent Beamformer Unit Group
ICD	Interface Control Document
ILSP	Integrated Logistics Support Plan
MAG	Mission Assurance Guidelines
MAR	Multiple Access Return
MSP	Mission Service Program
MSR	Monthly Status Review or Monthly Status Report
O&M	Operations & Maintenance
ORR	Operational Readiness Review
PCD	Program Commitment Document
PDR	Preliminary Design Review
PVM	Performance Verification Matrix
QA	Quality Assurance
RMA	Reliability, Maintainability, Availability
SET	Systems Engineering Team
SN	Space Network
SODA	Space Operations Directive Agreement
SOMO	Space Operations Management Office
SRR	Systems Requirements Review
SRT	Systems Review Team

STGT	Second TDRSS Ground Terminal
SWSI	SN Web-based Scheduling Interface
TDRSS	Tracking and Data Relay Satellite System
TGBFS	Third Generation Beamforming System
TNRR	Transition Readiness Review
TRR	Test Readiness Review
WBS	Work Breakdown Structure
WSC	White Sands Complex
WSGT	White Sands Ground Terminal